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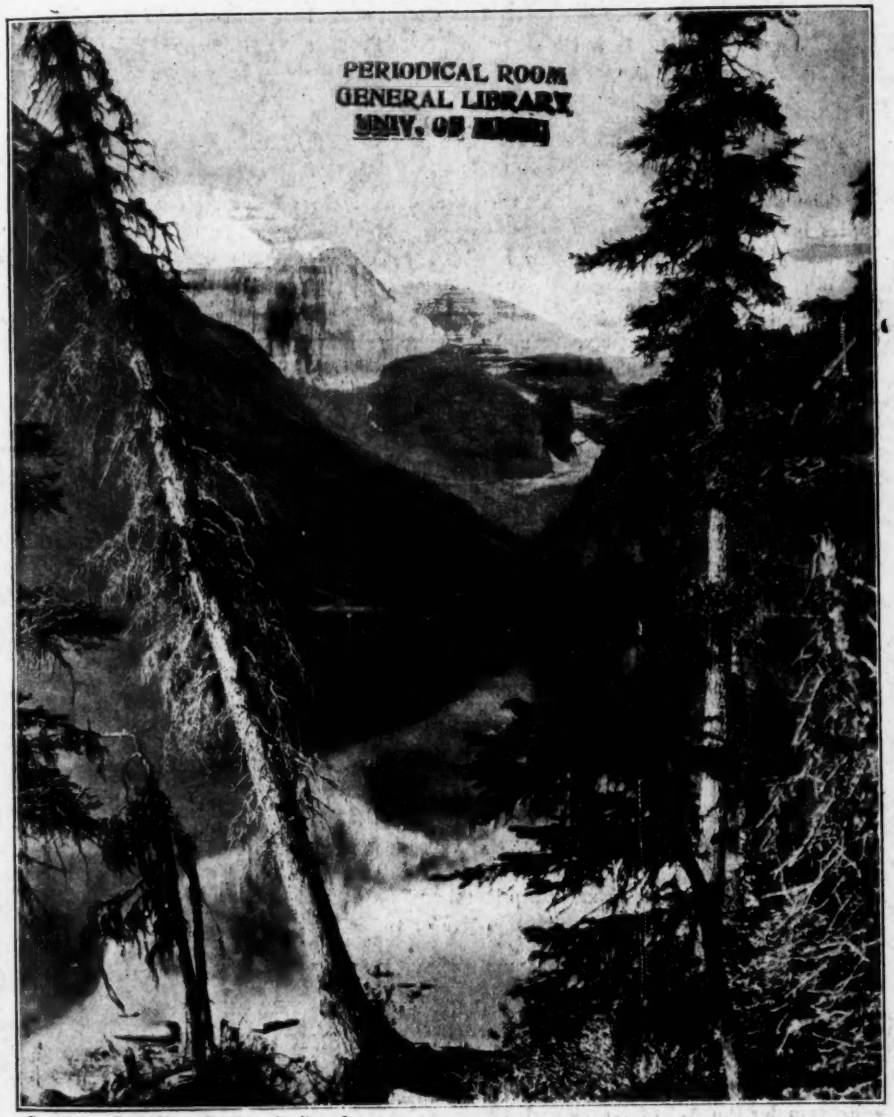
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THE JOURNAL OF GEOGRAPHY

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GEORGE J. MILLER, *Editor*
CORA P. SLETTEN, *Assistant Editor*
State Teachers College, Mankato, Minn.

Associate Editors

R. H. WHITBECK, University of Wisconsin, Madison
R. M. BROWN, Rhode Island College of Education, Providence
ERNA GRASSMUCK, State Department of Public Instruction, Harrisburg, Pa.
A. E. PARKINS, George Peabody College for Teachers, Nashville, Tennessee

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THE COAST WATERS AND THE COAST LANDS OF PERU*

R. H. WHITBECK
University of Wisconsin

THE COAST WATERS

Controlling Features of the Geographical Environment. Peru has the three major physiographic provinces characteristic of the west-coast countries of South America within the tropics: (1) a narrow coastal plain, with tributary mountain valleys; (2) a massive cordillera, 200 to 250 miles in width; and (3) an Oriente or eastern region of dense tropical forest, which includes more than half of the land of the country. In Colombia and in most of Ecuador, the coast lands lie in the belt of tropical rains and are heavily forested. But in Peru conditions are quite the reverse, for the country lies in the belt of the southeast trade winds, which precipitate their moisture on the eastern slopes and on the high portions of the Andes. In so far as these winds pass the mountains and descend the western slopes to the coastal plain, they are dry winds.

Along the Peruvian coast, the winds are directed mainly by local conditions and usually blow from the south and southwest. Blowing thus from the cool Humboldt current to the warm land, they increase in temperature and are drying winds. The result is that the coast of Peru is a desert; no crops can be grown except by artificial irrigation, and the amount of water that can be diverted from the fifty or more short mountain streams is the determining factor in agriculture on this coast; and agriculture is the dominating industry of Peru.

The huge mountain wall of the Peruvian Andes has no low passes. The two railways that cross the main range do so at elevations of 14,688 feet and 15,665 feet respectively. No attempt

* Modified form of a chapter in the writer's recently-issued book "Economic Geography of South America." McGraw-Hill Book Co., N.Y.

has yet been made to build a railroad across the eastern range in Peru. In the geography of this country, two factors are of primary importance; (1) the exceedingly mountainous surface and (2) the lack of sufficient rainfall on the Pacific slope. To these geographic handicaps the economic life of the nation must be adjusted.

Influence of the Humboldt Current. Ocean currents are due mainly to prevailing winds which blow more or less constantly over parts of the sea. On the coast of Chile and southern Peru, these winds from the west and southwest impel the surface waters of the ocean partially against the edge of the continent and partially parallel with it from south to north. Thus, a strong north-flowing current of cold water, known as the Humboldt current, is propelled northward along the coast of Peru and makes the temperature of the air above it many degrees cooler than the usual temperature for those latitudes. It is said that the temperature of the ocean waters off the port of Callao (latitude 12°) is comparable to that off New York (41°) and Monterey, Calif. (36°).[1] In the more northerly parts of Peru, the cooling influence of the current is increased by the upwelling of cold waters from the depths to replace the surface waters that the trade winds cause to drift westward across the Pacific as the Equatorial current. At least one investigator believes that this is the main cause of the low temperature along the Peruvian coast.[2] Since the ocean is cooler than the coast lands of Peru and since the winds blow from the sea across the littoral, they are warmed rather than cooled, as previously explained, and precipitate little moisture except the mists and fogs which are conspicuous in the winter. Thus, the lofty Andes cut off the coast of Peru from rainfall that might come from the east, and the Humboldt current prevents the local winds from the Pacific from delivering rainfall to the coast, and so this coast gets scarcely a shower from year end to year end.[3] Twenty or more miles inland, where the land is more elevated, rains fall.

Another important influence of the cool ocean current is its effect upon marine life in the waters along the Peruvian coast.

[1] Robert E. Coker, Ocean Temperatures off the Coast of Peru, *Geog. Rev., Vol.* 5, pp. 127-134, 1918

[2] Robert C. Murphy, *Geog. Rev.*, Vol. 13, pp. 64-85, 1923

[3] See Isaiah Bowman, The Andes of Southern Peru, Chap. 9, for discussion of the climatology of the Peruvian Andes.

"No waters in the ocean teem with life as do those on the west coast of South America."[4] The result of this upon the economic history of Peru has been far reaching. The superabundance of the lower forms of marine life provides food for a superabundance of fish with which these waters teem. The fish, in turn, provide food for the countless thousands of sea birds that haunt these waters and breed on the islands along the coast. The excrement of the birds and the fish waste which they leave form the valuable fertilizer known as guano, great quantities of which are found in this region. The Chincha Islands alone have yielded hundreds of millions of dollars' worth of this fertilizer.

The Guano Deposits and Their Economic Significance. Along the coast of Peru are thirty-eight small islands or groups of islands upon which the guano birds congregate in enormous numbers. A computation by a scientific investigator placed the number of birds on one island at nearly a million.[5] The surface of the sea and the air are literally alive with them, and steamers almost plow their way thru the endless flocks of birds flying close to the water. No less than twenty-four species of birds frequent the islands, and twelve or more nest upon them. However, a few, particularly the cormorants, pelicans, and gannets, deposit most of the guano. It has been estimated that at current prices, each pair of cormorants deposits guano to the value of $1.50 a year.

As a point of geographical interest it is worth noting that the Humboldt current is not only responsible for the abundant marine and bird life of this coast, and hence for the vast accumulations of guano, but it is also mainly responsible for the arid climate which has preserved the deposits from being removed by rain; for the most valuable constituents would be dissolved and carried away in a humid climate. The output of guano is now between 50,000 and 75,000 tons a year, most of which is used in Peru.

The Coast Lands

Everywhere along the west coast of South America the mountains are close to the sea, sometimes rising sharply from the water's edge and elsewhere faced by a belt of lowland. In Peru the coastal strip has a width varying from almost nothing up to one

[4] J. Y. Buchanan, *Proc. Royal Geog. Soc.*, Vol. 8, p. 766, 1886

[5] Robert E. Coker, The Fisheries and Guano Industry of Peru, Bull. U. S. Bur. of Fisheries, Vol. 28, pp. 335-365, 1908

hundred miles, but the average does not exceed thirty or forty miles. This is not all level land; low mountains or foothills appear everywhere, but among these are level lands of considerable extent, and there are alluvial valleys reaching well back into the mountains. The coastal region is geologically young, resulting from the recent uplift of a narrow border of continental shelf. The soil in the many valleys is alluvial. It is porous, and, under irrigation and fertilization, produces splendid crops of cotton, sugar cane, and rice, altho rice is not a major crop. On the western ranges of the Andes, in which the coastal rivers head, enough rain falls to give rise to some fifty-five short rivers that flow toward the Pacific and are partially or wholly diverted into irrigation canals. In the rainy season (December to April) these streams carry a large volume of water, but in the dry season they shrink to mere rivulets, and about half of them do not reach the sea at all. These mountain streams are the life givers of the coast lands, for without them these lands would be an absolute desert.

It is almost true that rain does not fall on this coast. On rare occasions it does fall, as it did early in 1925 when enormous damage was done by floods. A warm ocean current, coming from the north, crowded in between the coast of Peru and the cool Humboldt current which usually hugs this coast. Saturated air from this warm current drifted inland and caused terrific downpours that raised the streams to raging floods. Such occasions are very far apart, and the amount of water that falls in an ordinary decade is trifling. Residents of Lima assured me that it never rains there, and some appeared to feel it a disgrace to admit that even the smallest exception ever occurs. This was before the downpours and floods above referred to. One of the most lasting pictures that the traveler carries away from Peru is the utter bareness of the hills and mountains that skirt the coast and reach far inland. Most of the year not a green thing can be seen except along the occasional streams where irrigation is practiced; the Sahara is not more barren.

Small as the productive area of this coastal zone is, it is agriculturally and culturally the most important part of Peru. It contains the great sugar and cotton estates which supply most of the agricultural exports of the country. It includes, of course, all of the sea ports, and there are no less than twenty of these which carry on overseas commerce. It includes Lima, the capital and

educational, social, and financial center of the republic. It is in the coastal strip that most of the wealthy and influential families have their homes; usually a city home in Lima and the hacienda house on the estate in one of the irrigated valleys; or, less commonly, on a sheep or cattle hacienda in the cordillera. Moreover, this coast belt contains the most important petroleum field in western South America. The rest of Peru supplies little to the outside world except minerals. Nearly half the value of Peru's exports consists of cotton and sugar produced on less than one per cent of the land of the coastal strip.

EXTENT AND IMPORTANCE OF IRRIGATION

There is a rainfall of thirty to forty inches a year in the high Andes, and, during January, February, and March, the mountain streams are at flood. They plunge downward several thousand feet in flowing a distance of one hundred fifty miles or less, and become heavily laden with silt and gravel. As they flow out upon the coastal plain, their velocity is checked and they deposit their load in the form of alluvial fans and flood plains of considerable size. These flood plains and fans are the only agricultural lands of the coast of Peru. The Incas, and probably the pre-Incas, built extensive irrigation works for controlling the flood waters, and utilized them for the growing of crops. The Spaniards took possession of these canals and lands and assigned them to friends of the king or viceroy; many of the irrigation works built by the Indians are still in use. A competent authority believes that more lands were irrigated by the Incas than are now under irrigation in Peru. In all, about 1,000 square miles, 640,000 acres, are partially under irrigation along these streams, and it is believed that nearly as much more land is capable of irrigation by the expenditure of large sums of money for new and improved works. There are few storage reservoirs, and nearly all of the irrigation improvements are privately owned and managed. This irrigated land is the salvation of the nation, so far as agricultural exports are concerned. One of the large sugar estates, with its sugar central and other structures and its livestock, may be worth from $5,000,000 to $8,000,000. One very large group of estates having its own railroad and port is valued at $30,000,000.

Fifty-four per cent of the agricultural capital of Peru is invested in irrigated farms, and 59 per cent of the agricultural in-

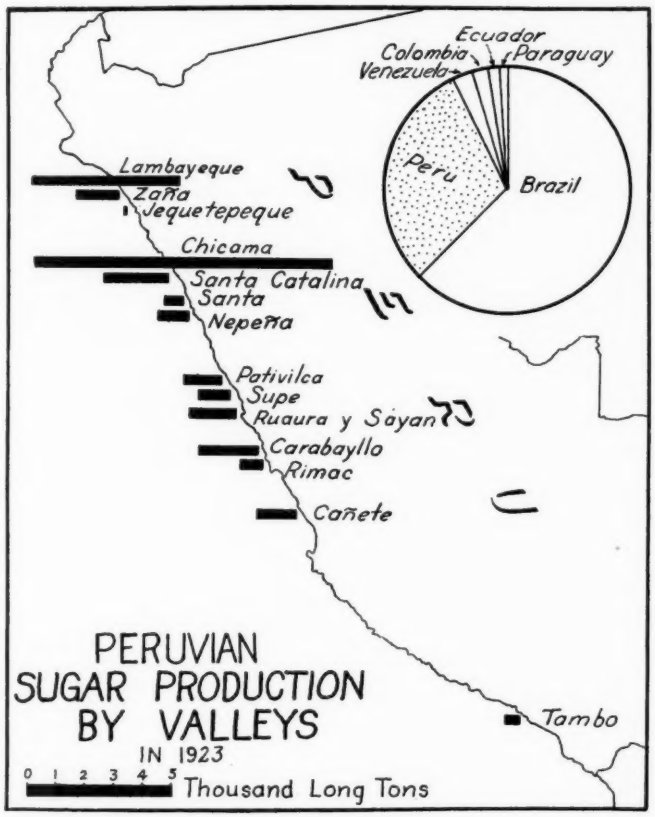
come is derived from them. It is estimated that one-half of the total national income from all sources is derived from activities dependent upon irrigation. Aside from the increase of national wealth from mining operations, about the only important means of increasing the country's income is thru an increased use of irrigation and improved methods of cultivation. Official sentiment in Peru is moving toward this view and new irrigation works are being undertaken by the government. But the planters are making money by present methods, and so it is difficult to persuade some of them that there is any serious need for improvement. A net profit of a quarter to a half million dollars from a sugar hacienda in a good year is not unusual.

THE SUGAR ESTATES

Sugar is the most important crop of Peru. More money is invested in the sugar industry than in any other (about $150,000,000), and yet the area of land devoted to sugar cane is only 120,000 acres, about one-third the area of a fair sized county in the United States. But the yield of cane per acre is large (about 30 tons) and the cane has a large sugar content (12 to 15 per cent), resulting in a high yield of sugar per acre. The average cost of production on the better haciendas is around two cents a pound. If the raw sugar sells for the moderate price of three cents a pound, the owner of the hacienda receives a net income of $100 per acre or about $400,000 from an estate containing 4,000 acres of sugar cane. Most of the sugar haciendas are in the northern valleys of the coastal plain. Here in seven or eight valleys are about 30 large sugar estates. There are also many smaller ones, giving a total of more than 100 in all, but there are only 35 large sugar mills. About 25,000 laborers are required on the sugar estates. The production of sugar is from 400,000,000 to 600,000,000 pounds a year, most of which is exported. All of the more important irrigated valleys are connected by short lines of railway to ports from which the sugar is shipped. The largest of these valleys is Chicama at whose seaward end is Trujillo, chief city of northern Peru; its shipping port is Salaverry. In the Chicama valley are six large estates, one of which contains 17,000 acres, tho not all of this is planted to cane. The Rimac valley in which Lima is situated contains two large sugar estates, and a small quantity of cane is grown still farther south, but most of it is grown north of Lima.

SUGAR CULTIVATION AND MANUFACTURE

To produce well, sugar cane requires rich land, and the Peruvian planters use guano and Chilean nitrate generously. In planting a new field of cane, the land is plowed and harrowed and then a series of shallow parallel trenches a few feet apart is made; in these trenches pieces of sugar cane, containing at least one joint,



are laid and covered with soil. Soon the new plants spring up, growing from the joints. While the growing cane is still small, the ground is cultivated to keep down the weeds, and irrigation water is supplied from the canals or wells, for many wells are used to supplement the river water. Within eighteen or twenty months from the time of planting, the cane is ready for cutting, and thereafter may be cut every twelve to eighteen months for several years; usually six to ten years. Cutting may take place at any time in the year, and is not controlled by the seasons as it is in

Louisiana or even in Cuba. The large mills grind cane practically thruout the year. Chile is the largest buyer of Peruvian sugar, for the obvious reason for the proximity of the two countries.

On the large estates are workmen's villages of small one- or two-room huts in which the Indian laborers live, often sharing their quarters with pigs, dogs, and chickens. The greater part of the labor is done by Indians whose homes are in the mountains and who come to the sugar estates to work when they are not needed on their little farms. Schools are provided by the owner of the estate and the children of the workers may learn to read, write, and compute. Common laborers earn 50 cents to $1.00 a day, and there is usually a shortage of labor. Heavy drinking is common, and coca chewing is almost universal among the Indians. On the whole, the social and living conditions are far from satisfactory, but those employers who seek to improve the conditions get scant coöperation from the ignorant laborers who are accustomed to this plane of living. However, labor agitators are common and labor troubles are frequent.

The Chiclin Sugar Estate, belonging to two brothers of a prominent Peruvian family, is one that is doing the most for its workmen and their families. On the estate are six school buildings in which 400 or 500 children of the workers are giving excellent educational opportunities. There is a night school for workmen themselves, and a domestic training school for girls. A park, playground, theater, and church are maintained. There are electric lights, running water, and enlightened sanitary measures. About 2500 people live on the estate of 5000 acres, mainly devoted to sugar cane. Three thousand cattle are kept for draft animals and for beef. Only a minor part of the water needed for irrigation comes from the river; the larger part is obtained from six very large wells which are constantly pumped by means of engines. Notwithstanding the expenditures for social betterment made by the owners, this estate is still a highly profitable one.

The Casa Granda group of estates is noteworthy for the magnitude of the properties, for nearly one-fourth of the sugar produced in Peru comes from them. There are 10 estates in the group and three other groups in Chicama Valley have 18 estates, or a total of 28, comprising about 1,500,000 acres. In addition the company owns 425,000 acres in the foothills of the Andes. Thousands of cattle, sheep, and hogs are kept, mainly to provide for the needs

of the people who live in this principality of sugar. Rice, cereals, fruit, dairy products, and other foodstuffs are produced. The company has a modern sugar mill capable of grinding 4500 tons of cane daily. It owns and operates 125 miles of railway, in addition to a much larger mileage of portable, field railways, and owns its own docks at the port. The total property is said to be worth upwards of $30,000,000. It belongs to a company that was originally German, but is now regarded as Peruvian. Many a feudal holding in Europe was far smaller and less wealthy than this.

The Cultivation of Cotton

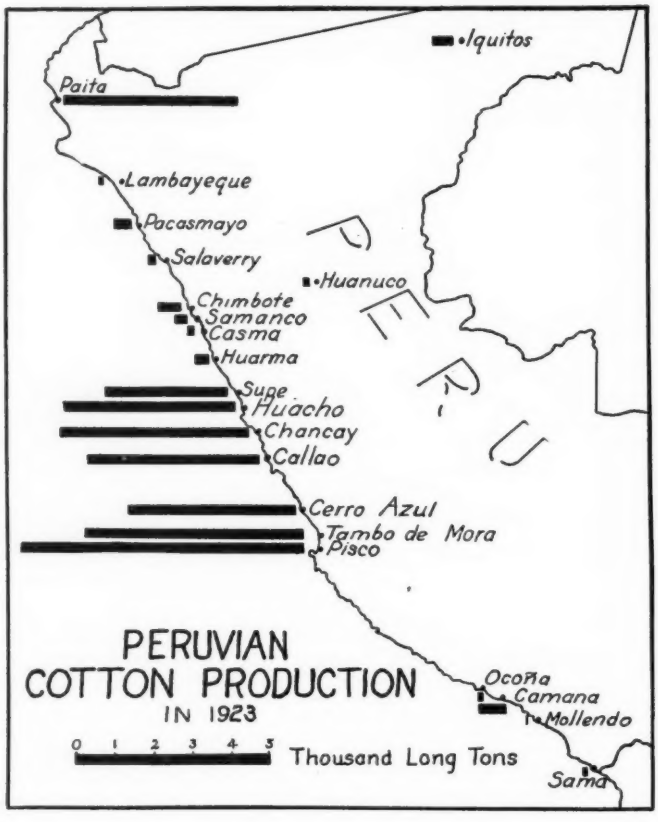
The second most valuable crop of Peru is cotton, of which a number of varieties are grown. Practically all of the cotton is produced on about 140,000 acres in the irrigated valleys near the coast, twenty in all. The most important of these cotton-growing districts are between Supe and Pisco north and south of Callao. The Rimac valley, in which Lima is located, is one of the more important cotton-growing districts. Another leading district is the region near Paita in the extreme north. The two varieties most largely grown are known as Tangüis and Suave or Egipto. The former is a disease-resistant variety developed by Señor Tangüis, a scientific cotton planter of Pisco. This is proving to be the salvation of cotton growing in Peru, for the industry was threatened with ruin by a disease known as the "wilt," altho the dreaded boll weevil has not invaded Peru. Not only is the Tangüis resistant to wilt, but it has a "long staple" (1 1/4 inches) and yields 25 to 30 per cent more cotton to the acre than any other variety. In recent years, it has supplied about two-thirds of the Peruvian crop.

A variety, known as the "full rough" has been grown in the north of Peru since the days of the Incas. Its peculiarity is the crinkley nature of the fiber which leads to its beings mixed with wool in making certain types of textiles. Most of the Peruvian cottons have a rather long fiber, which adds to their value. Under the ideal climate and water control, the cotton fields of Peru produce on an average twice as much cotton per acre as those of the United States.

The crop is not planted every year, as it is in the United States, but the plant bears for several years, and may grow to a height of ten to fifteen feet. Picking goes on every month of the year in one field or another. The best success is achieved on large plantations

whose owners have the necessary capital to finance their operations, to employ up-to-date methods, and to own their own ginneries. There is a tendency for the small plantations to be absorbed into the larger ones.

When prices are good, cotton growing is very profitable, occasionally yielding 100 per cent profit. About nine-tenths of the



crop is exported; 1500 bales a year are used in the eleven textile mills of the country, eight of which are in or near Lima. The annual value of the cotton crop approximates $25,000,000.

National Significance of the Sugar and Cotton Crops

Both sugar growing and cotton growing are excellent adjustments to the peculiar geographical conditions of the Peruvian coast. Both crops readily adapt themselves to perennial growth; both are staple products with steady demand in a world-wide market; both

are well suited to transportation long distances, and are not perishable. They can be stored without deterioration and they yield an excellent return to the planter.

The annual crop is steadily increasing, and in 1925 it was more than double what it was prior to 1915. As an illustration of the importance of such intensive agriculture as that carried on in the irrigated valleys of the Peruvian coast, it may be appointed out (1) that the value of the sugar exported each year from less than two hundred square miles of this land nearly equals the value of all the agricultural products exported from the country of Venezuela; and (2) that the cotton annually exported from two hundred and twenty square miles of Peru equals in value all the exports from Ecuador. Moreover, the cotton and sugar of Peru are produced almost within sight of the sea ports from which they are shipped, while the coffee of Colombia and Venezuela are grown far back in the mountains, necessitating a very expensive journey to the port of shipment.

The Cultivation of Rice

Rice is the most important food of tropical peoples. In the coast provinces of Peru and in many other parts of South America, rice and beans form the staple and preferred food of the working class. Of all the cereal foods, rice is the most convenient to use.

The production of rice in Peru is practically confined to a narrow strip of coast in the extreme northwestern part of the country, where it is raised under irrigation, and yields two crops a year. Much of the rice is of inferior quality and may be bought at a low price, which suits the poorly paid peons. Some rice of superior quality is raised and is largely exported; while less expensive Asiatic rice is imported. The chief movement of this product is in the form of imports. The production of rice in Peru is increasing, having risen from about sixty-five million pounds in 1910 to two and one-half times that quantity thirteen years later.

The Petroleum Fields

Peru was long the chief producer of petroleum in South America but has been surpassed by Venezuela. Fortunately, the oil fields are close to the sea; in fact, most of the wells are on the very shore, thus greatly cheapening the cost of marketing the oil. There are four recognized oil fields, all in the extreme northwestern part

of the country, not far from the boundary of Ecuador. Drilling operations in this region date from 1870, but production did not reach a million barrels until 1908; it rose steadily to about eight million barrels in 1925. None of the four fields has ever been a spectacular producer, and the average daily production is ten to fifteen barrels per well but individual wells have yielded upwards of 1,000 barrels a day in the first days of their production. The oil is of excellent quality, containing a high portion of kerosene and gasoline. A large refinery is located at the port of Talara. The leading company in the field is a subsidiary of the Standard Oil Company.

THE OBJECTIVE MEASUREMENT OF PROBLEM GEOGRAPHY

Mendel E. Branom
Harris Teachers College, St. Louis, Missouri

The Problem and Factual Details

The aims of geographic study are realized thru the organization and presentation of the selected content. Within recent years the problem organization of material has been stressed. The emphasis placed on problem solving has led some teachers and students to assume that the facts of geography are of little or no significance. One teacher recently remarked "I am enthusiastic over problem geography. The children get the big ideas and do not have to burden their minds with the factual details." Did this teacher have the right notion of the problem method?

The problem "Account for the importance of New York City," may be interpreted by stating that New York City (1) has a good harbor, (2) faces a large ocean, and (3) is connected with the interior by excellent routes. General statements may be used to meet the conditions of the problem. The teacher may permit the pupils to engage in abstractions. The pupils may "finish" their study of New York City without securing impressions of concrete details or a knowledge of place names. Such a result is not an inherent weakness but a misuse of the problem method.

The interpretation of the problem should involve the use of a wealth of concrete details. A consideration of locational advantages involves a study of Manhattan Island, Staten Island, and Long Island, the lower course of the Hudson River, the East

River, and the Harlem River, the Upper Bay, the Lower Bay, and the Ambrose Channel. The easy route to the interior should include a vivid presentation of the Hudson River, the Mohawk gateway, and the Ontario plains. The seaward relations should include a study of how the ocean barrier has been lessened. The problem method does not excuse a teacher from developing a knowledge of concrete details; it offers an opportunity to teach concrete details in relation to a highly motivated organizing center. A general statement should be resolved into parts that will be readily understood by the pupils.

The problem method does not necessarily call for a set of facts different from that of the topical method. The facts are merely organized differently. The minimum essentials for a region may be listed without reference to any method. Then the question arises, How can this content be taught most effectively? The problem method is merely a means to an end. It is justified only if the content, skills, ideals and appreciations are more satisfactorily taught than by some other method.

The Problem Method and Testing

In view of the fact that geography can be taught very superficially even by the problem method, it is not safe to assume that the work of the teacher of problem geography is satisfactory. The product of instruction should be measured. The teacher may resort to (1) subjective tests, or (2) objective tests. If a subjective test is given, the teacher may quickly place several questions on the board. The real work of the teacher comes when she attempts to grade the papers. It has been determined experimentally that grades thus secured are not very reliable. The subjective nature of the grade is indicated by the question of the pupil, "I wonder what the *teacher* will give me." If an objective test is given, the teacher must spend much time in preparing the test, or use a test that another person has spent much time in preparing. The papers are easily corrected. Barring clerical inaccuracy, one person can correct the papers as readily as another. The objective nature of the grade is indicated by the question of the pupil, "I wonder what *I* will get."

Tests should measure the ability of the pupils both on a problem and a memoritor level. They should stress (1) interpretative geography, (2) factual geography, and (3) place geography.

PROBLEMS AND TESTS APPLIED TO THE NEW ENGLAND STATES

The New England States may be taken as an illustration of the possibilities (1) of teaching by the problem method, and (2) of measuring the educational outcomes thru objective tests.

The following problems were motivated and discussed:

1. Why has agriculture in New England relatively declined?
2. What is the basis for a revival of New England agriculture?
3. Why are the people of New England coming to prize their forests more highly than formerly?
4. Why, in spite of serious handicaps, is manufacturing very important?
5. Is it probable that New England will lose its importance as a manufacturing area?
6. Why is quarrying an important industry?
7. Why is the fishing industry more important than along the South Atlantic coast of the United States?
8. Why does New England attract many tourists?
9. How has Boston been able to maintain its leadership among the cities of New England?
10. Account for the fact that the largest city of Connecticut is on Long Island Sound and not even at the mouth of the Connecticut River.
11. Will Hartford or New Haven probably be the largest city fifty years hence? (a speculative question).
12. What are some of the factors that help to explain the fact that the Merrimac River "turns more spindles than any other river in the world?"
13. Why is the eastern part of Rhode Island much more densely populated than the western part?
14. What factors have led the National Government to establish a National Park on Mount Desert Island?
15. How did New England come to have its present surface features?
16. What are some of the factors that help to explain the climatic conditions of New England?
17. Why is southern New England much more densely populated than northern New England?
18. Under what conditions may New England continue to support a large population?

Space will not permit the elaboration of each of the listed problems. The working organization for each problem may be inferred from the following example:

ORGANIZING CENTER: THE AGRICULTURE OF NEW ENGLAND

1. Exercise
   (1) The importance of agriculture in colonial days
   (2) Increasing urban populations
   (3) Abandonment of New England farms

2. Discovery
   New England agriculture is much less important than in early days.
3. Problem
   Why has agriculture in New England relatively declined?
4. Endeavor
   (1) Relief, (2) Soils, (3) Climate, (4) Competition of manufacturing centers, (5) Competition of favored agricultural areas, (6) Improved transportation facilities
5. Achievement. Summary of results
6. Satisfaction. A subjective effect

OBJECTIVE TESTS ON NEW ENGLAND

Test One. The True-False Test. Sentences

Place a "+" sign before each statement that is entirely true; place a "—" sign before each statement that is not entirely true. If you are not certain do not answer.

.... 1. Cape Cod is a high, broken, rocky point of land.
.... 2. All the swamps of New England at one time were lakes.
.... 3. The three northern states supply more wood pulp for the making of paper than the three southern states.
.... 4. The most widespread and important rock quarried in New England is marble.
.... 5. The water power and the coal mines in New England have helped this region to become important in manufacturing.
.... 6. Much of the New England coastline is hilly and uneven.
.... 7. Much of the soil of New England is thin or bowldery.
.... 8. An important industry on Cape Cod is the raising of cranberries.
.... 9. The Connecticut River is tidal from source to mouth.
....10. The factories of New England turn out small metal goods rather than heavy, bulky goods.

Test Two. The Correct or Best Answer Test. Paragraphs

Place a cross before the best answer to each topic. If you do not feel sure, do not answer.

1. Discuss the paper industry of New England

....(1) In the early days, many small factories made paper from rags. Larger machines, requiring more power, were invented. The industry tended to become fixed where there was much cheap water power. Paper mills were built at water falls in the woods of northern Maine. Many rags were sent to these factories. It was found by chance that the soft woods about these mills could be reduced to wood pulp and made into paper. These factories gradually came to use wood pulp instead of rags. New England now makes much more paper from wood pulp than from rags.

....(2) The best paper comes from the paper mills of northern New England. These mills are located at water falls. The nearby forests supply the needed wood for wood pulp. The blocks of wood are first reduced to wood pulp which is then made into paper. A poorer grade of paper is made in some of the cities of southern New England. This poorer paper is made from rags collected in the large cities.

....(3) In the early days, many small factories made paper out of rags. These factories, in general, were located in southern New England where there were many people. Today more paper is made from wood pulp than from rags. Northern New England has many soft woods for the making of paper, and also much water power. While there are still factories in southern New England that make paper from rags, the industry has tended to shift to the water falls of the northern forests.

2. Discuss the woolen industry of New England

....(1) The New England farmers had many flocks of sheep. Almost no cotton was grown. Textile mills, using wool, naturally became important. Some years later, cotton was brought in, and the weaving of cotton cloth was begun in factories. The woolen mills now draw on many parts of the world for wool.

....(2) The New England farmers sheared their flocks of sheep. Members of the family made the wool into cloth. Since cotton was not raised, almost no cotton cloth was made in the homes. In the first textile mills built, cotton, rather than woolen cloth, was made, for the people did not need to buy much woolen cloth. Some years later, the weaving of woolen cloth in factories was also begun.

....(3) Many textile mills for weaving cotton and woolen cloth were set up at water falls. The farmers of New England were soon unable to supply the mills with enough cotton and wool. Cotton and wool were sent in from other places. Soon certain factories began to make only cotton cloth, while other factories made only woolen cloth.

3. Discuss the manufacture of metal products in New England

....(1) New England, at first, made heavy, bulky things, as rails and framework for buildings. As its workmen came to have more skill, it turned to the manufacture of small metal products, which are several times more valuable than the raw metals. New England now specializes in small metal products.

....(2) In the early days, New England made many small things from metals. The experience of the New Englanders in the use of metals in a small way prepared them to make larger and heavier articles. As a result, New England is well-known, not only for its production of small metal goods, but also for its rails, and steel for bridges and skyscrapers. Most of the coal and iron are now brought from other states to the skilled workers of New England.

....(3) In the early days, iron ore was taken from the bogs of New England. Ships sometimes brought back metals, such as gold and silver. People made many small things out of these metals. New England came to import large quantities of raw metals for its factories. New England must now bring in the raw metals and also coal to supplement the water power. Its skilled workmen and the reputation of its products have helped it to remain a leader in small metal goods.

4. Discuss the Merrimac River Valley

....(1) Newburyport, at the mouth of the Merrimac River, was an important seaport when ocean ships were small. There are many water falls along this stream. It is said that this river turns more spindles than any other river in the world. The land between Boston and the Merrimac River is low and smooth. The railroads which extend along this depression have helped Boston to take the place of Newburyport as the seaport serving the Merrimac Valley.

....(2) Many cotton and woolen mills use the water power of the Merrimac River. Most of these mills now supplement the water power with power secured from coal. Factories for the making of shoes were first built. These factories were followed by cotton and woolen mills, which have become more important than the shoe factories. Newburyport remains the important seaport of the Valley. The high, hilly land between Boston and the river has made it difficult for Boston to exercise much influence in the affairs of the valley.

....(3) The many water falls of the Merrimac River are being used for power. An increase in manufacturing is difficult because coal is too expensive to compete with water power. With so many factories lining its banks, the Merrimac naturally is very important for navigation. Newburyport, in the early days, was a prosperous port serving the Merrimac Valley. The harbor at Newburyport has been improved, and this city again is becoming the metropolis of the Merrimac Valley.

5. Discuss the city of Boston

....(1) Boston has never lost its early position as the leading city of New England. It is nearer Northwest Europe than New York City. Railroads extend westward to the Mohawk depression. Most of the commerce of the United States is now carried by railroads: This fact has helped Boston to become a more important commercial port than New York City, altho the latter city is much larger. Boston is a well-known shoe center.

....(2) Boston, the largest city of New England, is on an excellent harbor near the entrance to Massachusetts Bay. The harbor is well-protected by islands. The railroads must cross the hilly Berkshire Hills to reach the Hudson River. The grades are so heavy that but little freight is carried, altho the passenger traffic is heavy. Boston, until recently, was a great receiving center for the mill towns of New England. Each industrial city now tends to receive its raw material and to sell its finished products directly. Boston no longer exerts a marked influence in the affairs of New England.

....(3) Boston, the largest city of New England, is on an excellent harbor at the westernmost point on Massachusetts Bay. Railroads now connect Boston with the Mohawk gateway, New York City, and northern New England. Boston gets a fair share of the trade of the interior, but it is chiefly the leading city of New England. It receives raw materials used in the industrial cities and sells their products. Boston is a leading shoe center.

Test Three. Physical and Social Facts

Answer the following:

1. Name the largest city of New England.....
2. Name the largest city of Maine.....
3. In what city is Harvard University?.....
4. Name the capital city of Connecticut.....
5. Name the smallest state of the New England States.....
6. Which state quarries the most marble?.....
7. Name the highest mountain peak of New England.....
8. Name the principal river of New Hampshire.....
9. What mountains are in Vermont?.....
10. Name the longest river of New England.....

Test Four. The Location of Cities and Physical Features by States

By means of state abbreviations, indicate the state in which each of the following cities or physical features is found.

1. Penobscot River .....
2. Cape Ann .....
3. Merrimac River Mouth.....
4. Cape Cod .....
5. Boston .....
6. Bridgeport .....
7. Lawrence .....
8. Burlington .....
9. Portland .....
10. Rutland .....
11. Augusta .....
12. Newport .....
13. Providence .....
14. Haverhill .....
15. Worcester .....

Test Five. The Physical Locations of Cities

After each city, place the proper number, taken from the second list, that will show the physical location.

Cities	Physical Features	
1. Providence	1. Cape Cod Bay.	6. Penebscot River.
2. Holyoke	2. Buzzards Bay.	7. Kennebec River.
3. Augusta	3. Long Island Sound.	8. Narragansett Bay.
4. Lowell	4. Connecticut River.	9. Casco Bay.
5. New Haven	5. Merrimac River.	10. St. Croix River.

Test Six. Cities and Facts

After each city, place the proper number, taken from the second list, that will show the thing for which it is best known.

Cities	Facts	
1. Gloucester	1. Marble.	6. Granite.
2. Haverhill	2. Locomotives.	7. Watches.
3. Waterbury	3. Tacks.	8. Sewing Machines.
4. Barre	4. Fish.	9. Lumber.
5. Bangor	5. Cranberries.	10. Potatoes.

The Value of Objective Tests

Four sets of tests, similar to the above set, have been worked out for the New England States. The place, factual, and interpretative material found in the combined sets is a comprehensive consideration of practically all that is taught thru the listed problems. The pupil in anticipation of the tests is encouraged to attempt to master all the situations confronting him rather than to attempt to guess what the teacher will ask.

The pupils are measured with reference to their ability to recall facts, and to interpret facts. In all the tests they are seeking for the truth, or are seeking to express the truth. While these tests do not measure directly the ability of the pupils to recall and organize facts without assistance of any kind, the writer's comparative studies indicate that there is a high degree of correlation between the two types of tests. Moreover, the chief use that most of the students in our public schools will have for geography will be the recognition and evaluation of geographic material that has been organized and presented thru newspapers, magazines, books, and lectures.

Not the least important of the values of objective tests is their influence on the habits and attitudes of the pupils who work for work's sake rather than for the teacher's sake. The work takes on

a new dignity, because the pupils realize that the prejudice of the teacher is entirely eliminated. A fine spirit is developed between teacher and pupils, for the pupils realize that the teacher is present to direct them in their progress. It is manifestly inconsistent that the teacher, who uses her subjective skill in teaching the pupil, should also use her subjective judgment in measuring the pupil. The scores of the pupils are properly distributed so that a pupil can measure his achievement with reference to the median and to other pupils. Each pupil, as successive tests are given, also draws his line of achievement on graf paper, so that he can measure his individual progress irrespective of the achievement of other pupils.

CONCLUSIONS

1. The problem method, properly used, involves the use of numerous concrete details.

2. Since the use of the problem method is not a certain guarantee that the aims of geographic instruction are being realized, adequate tests should be devised.

3. The devised tests should permit the use of objective standards in grading.

4. The tests should involve (1) place geography, (2) factual geography, and (3) problem geography.

5. Objective tests, to check achievement in problem geography, can be devised both on a memoritor and a problem level.

6. Tests, stressing the essentials in geography, should be applicable as measuring rods, irrespective of the particular method of teaching that is involved. Tests are not a revelation of methods used, but of results obtained.

7. The teacher, who is beginning to use objective tests, should at first check results with subjective tests. As her confidence in the use of objective tests increases, she may gradually dispense with the use of subjective tests.

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A MID-WESTERN TORNADO

MARJORIE MAE SHANK
Southern Illinois State Normal University
Carbondale, Illinois

One of the most destructive tornadoes which ever occurred in the United States devastated an area north of the Ohio River on Wednesday afternoon, March 18, 1925. This storm afforded an excellent opportunity for study and observation in the light of the general theory of tornado development. In many respects this disturbance was typical of its kind.

TORNADOES IN GENERAL

Tornadoes are somewhat difficult to study because of their infrequency, their sudden unexpected occurrences, and rapid disappearances. They are most numerous in the central portion of the United States, arising in the central lowland east of the Rocky Mountains, traveling eastward roughly parallel to the Ohio River, and disappearing before reaching the mountainous region to the east. In looking for a cause for these destructive storms, we find that they occur only where there are great differences of temperature between regions in close proximity. Perhaps the area subject to tornadoes is determined by the relief and shape of North America. The great central portion of the continent is unbroken by mountain ranges in a north-south direction. Thus in early spring, cold air sweeping from the north and warm air coming from southern regions cause great variations in heat within short distances. The theory is that these great differences in temperature, and consequently in pressure, occurring in close proximity, give rise to sharp convection currents. When one of these local storms is of small diameter and the whirl becomes so intense as to be violently destructive, it is called a tornado. As this develops, the air pressure in the center becomes very low. The tornado originates above the earth and works downward as it develops. Thus the whole storm takes on a funnel shape, a long dangling cloud extending toward the earth, working destruction wherever it touches. The dark cloud of the tornado is composed of moisture condensed by the rapid cooling of the air in the convection current. There may also be present foreign material from the earth, but it is not essential to the visibility of the tornado. These storms usually occur near the center of a cyclone or low

pressure area where pressure conditions are favorable for their development. The whirl as in other cyclones in the northern hemisphere is counterclockwise. In general as the season advances, the greatest differences in temperature will occur between places in higher latitudes. Consequently storms are of greater frequency in early spring in areas near the Ohio River while the more northern states have a greater number somewhat later in the season.

THE TORNADO OF MARCH 18, 1925

On the morning of this day, March 18, a well developed low pressure area or cyclone centered near Fort Smith in north-

FIG. 1. Sketch map showing path of the tornado

western Arkansas. During the day this moved rapidly toward the northeast, centering the following morning in western New York. In this case the path of the tornado was very nearly that of the cyclone, being only about sixty miles distant, diverging slightly to the eastward. According to a barograph one mile south of the tornado path, the center of the tornado passed at the same time as the center of the cyclone.

Immediately preceding the storm, as one would expect, there were very marked temperature differences between places in central and southern Illinois. The maximum temperature for Spring-

field that day was 27° F. lower than the maximum for Cairo and Anna, Illinois.

When the storm developed the cold air rushed in, particularly from the north, and moved with a great upward whirling motion. This sharp rise of the air in strong convection currents with rapid overturning caused heavy condensation, producing a black cloud. On the arrival of the storm there were intermittent flashes of lightning, then darkness prevailed, accompanied by a downpour of rain, hail, and accumulated debris. The hail seems to have been general thruout the path and for some little distance along the edges. As the air developed the whirl, the pressure became very

FIG. 2. A scene in the former residencç section of Murphysboro

low in the center. This was evidenced by numerous reports of a suffocating feeling given by those in the area. We are also sure this occurred because a few buildings in the path showed the results of "explosions." As the low pressure area approached and prevailed outside the buildings, the high pressure within forced out the walls. In Murphysboro, for example, a few western walls were thrown in that diretion while the major portions of the houses were carried on to the east. Occasionally one might have found a house with one wall gone, the rest of the house standing, the furniture untouched, and even small pictures, insecurely fastened, still remaining on the wall. This evidence of low pressure in the center of the storm is in accordance with the theory of tornado action.

The storm itself traveled at the rate of about sixty miles per hour. This figure was secured by computation from Western Union clocks stopped by the storm. Thruout most of the course the path

varied from three-fourths to one mile in width, being somewhat wider than the average. Since the theory is that the air moves spirally upward, the whirl on the ground should have a diameter equal to the width of the path. Since the storm traveled at about the rate of a mile per minute, the destruction should last only about a minute. This agrees fairly well with estimates made by those in the storm, tho the rain and hail lasted somewhat longer. Within about five minutes time, the sun was again shining, making favorable the weather conditions for man to begin upon his long task of

FIG. 3. Near the center of the storm path in De Soto. The camera was pointed north—the direction in which this particular house was moved. The telegraph line seen in the background was replaced after the storm.

saving lives and clearing up the wreckage so suddenly and completely produced.

THE EFFECT OF THE TORNADO

From the destruction, the wind in the storm is estimated to have attained a velocity of 400 miles per hour, a rate sufficient in many cases to sweep the ground clean. The storm was remarkable in the uniformity of its destruction thruout the great length of its path. One might have followed it for miles and never have had to climb even a wire fence, so complete was the devastation. Buildings were razed thruout the length of the path. In some cases they were completely removed. In most instances they did not simply col-

lapse, but were broken in large part into kindling wood. The boards, pieces of tin roofing, and bits of clothing were scattered over the countryside, in some instances miles from their sources. In some places the scene was not unlike that following a flood. The few standing tree trunks, and scattered debris were covered with a layer of dried mud, and the results of the rain were everywhere in evidence.

The major portion of the debris, such as sticks and trees were dropped in parallel positions pointing in the direction which the storm traveled, approximately east-northeast. Near the north

FIG. 4. Thruout most of the area the debris was carried to the east-northeast. This is shown in the accompanying photograph of a cornfield.

edge, however, many buildings and trees, which are most easily traced, fell to the east and southeast. On the southern edge of the path more fell to the north and northeast. In a few areas there was not this uniformity of position, trees simply having been twisted and dropped in a heterogeneous manner. It was evident from this study that there was a large whirl, perhaps resembling an inverted truncated cone. In other words, the typical funnel, instead of being higher in the air with only the tip touching the earth, was very much lower down. This would be entirely possible according to the general theory of tornadoes.

The upper currents of air drifted to the northward from the storm path. This was evident from the miscellaneous debris of the storm, such as shingles, papers, pieces of tin roofing, and bits

of clothing, which settled to the north of the devastated area. No instances have been noted of wreckage falling to the south. Some of these bits traveled as much as 200 miles from their starting places before being dropped to the ground.

From the standpoint of loss of life, the toll was greater than in any single windstorm ever before occurring in the United States. Other losses such as that of Galveston have been greater, but in those instances the wind was followed by a flood which exacted the greater toll. On February 19, 1884, however, according to the March issue of the American Meteorological Society, fifty-seven tornadoes occurred in the same day, killing 1,200 people. The number of lives taken by the tornado of March 18 was about 825, according to figures given out by the Red Cross, with about 3,000 more injured. The suffering was intense, due both to injury inflicted by falling buildings and trees and to the fire which in a great many cases followed the storm. Sometimes in order to remove injured people pinned under the wreckage, amputations were performed on the spot without anesthetics.

FIG. 5. One of the freaks of the storm

ECONOMIC CONSIDERATIONS

From an economic standpoint it is difficult to determine the actual loss. The estimate generally accepted is about $18,000,000. The estimate for the St. Louis storm of 1896 was approximately $13,000,000. When one considers the decreased value of the dollar, perhaps there is not much difference in actual loss. In Murphysboro 152 city blocks were practically demolished, and much more of the city damaged. Only thirty telephones were in working order

when the tornado had passed. Sixty per cent of the thriving little city of 13,000 was destroyed, 70 per cent of the residence district. About 15 per cent of this was covered by tornado insurance Smaller villages such as Gorham, DeSoto, and Parrish in Illinois, and Griffin in Indiana, suffered a much higher percentage of loss. In all of the above mentioned villages only a few buildings remained standing and in some none were uninjured. In several of the towns, many of the people returned to rebuild. Some have definitely decided to go elsewhere.

One of the remarkable features of the storm was the uniformity of its destruction thruout a length of 219 miles. While this is not the longest on record, it is very much above the average. The storm originated in the western part of Reynolds County, Missouri, and followed a remarkably straight course to its termination three miles south of Petersburg in Pike County, Indiana. The path varied from one-half to a mile in width thruout most of its length tho it was narrower near the ends.

The rapid and willing response of the people thruout the United States to the sudden need for medical attention, food, clothing, and shelter, made possible an early step toward recovery in the storm swept area. Within a few days after the storm the Red Cross was in charge of the rehabilitation of the entire region. Here its representatives will remain until all again are sheltered and able to continue their occupations. According to Professor H. M. Baker, national director of the American Red Cross, 6,853 families registered for relief. These were rehabilitated at the rate of about 100 per week. The total relief fund contributed for storm relief reached $2,650,000.

CONCLUSION

At the present time this particular phase of the weather is unpredictable. The meteorologist knows when temperature and pressure conditions are favorable, but the time, exact place, and even the development are uncertain. When the Weather Bureau predicts severe local storms, the conditions are usually favorable for tornado development and it is well to look for the black funnel-shaped cloud. If one sees a tornado coming, he may in many instances avoid the storm by running at right angles to the path or to the southeast or northwest, since the track is almost invariably in a northeasterly direction. If one is in the storm, perhaps as safe

a place as any outside of a storm cave is in the basement of a building in the southwest corner. In many instances the floor of the house is left untouched, serving as a protection to the basement.

According to the March issue of the Bulletin of the American Meteorological Society, 876 tornadoes are known to have devastated portions of mid-western United States, in the nine years, 1916 to 1924, inclusive, taking 2,242 lives and destroying property valued at $92,000,000. If one were to compute, however, the possibility that any one square mile of the most dangerous zone might be visited by a tornado in the course of a century, he would find that it is only a fraction of one per cent. Since it is impossible to state the exact place and time of occurrence of these destructive storms, it is psychologically undesirable even to venture suggestions.

GEOGRAPHY IN THE SCHOOLS OF FINLAND

KARL KEKONI
Ekenäs High School, Finland

THE EDUCATIONAL SYSTEM

Before I try to give a short account of the position of geography in the schools of Finland it seems to me advisable in a few words to characterize the Finnish system of education.

Apart from technical schools and other institutions of learning for special purposes the system comprises elementary schools and secondary schools. The former contain six grades or classes, two in the lower, four in the higher part of the school. The latter group again comprises two types of secondary schools, the one having five classes, the other eight or, in a few cases, nine. The former, which roughly corresponds to the junior high school of America, prepares the pupils for entrance to the commercial and technical high schools and for certain branches of the civil service. The latter works in close connection with the universities. Its course terminates with a general examination which gives access to all the principal institutions of learning, including the military colleges. The secondary schools receive their pupils partly from the elementary schools, partly from the preparatory classes attached to the schools themselves. There is no general examination at the end of the junior high school course, but the "studentexamen," carried on by the University of Helsingfors in conjunction

with the Board of Education, is now-a-days considered rather severe.

The principal high schools of Finland are state institutions but a large number are run by private corporations, while only a few belong to the cities or parishes. The latter, both private and communal, receive considerable support from the state if they follow the program of studies prescribed for the state schools. Of these there are two types. The one may be characterized as "modern," corresponding roughly to the German "Oberrealshule," the other as "classical," answering to the German "Gymnasium." There is, however, a tendency to provide a greater variety of courses, at least in the large schools.

In closing this rapid survey I must add that the administration of the schools is highly centralized and that the curricula are almost identical in all the schools belonging to the same group. Only a few subjects, such as singing and the English language, are optional, while all the other subjects must be taken by every pupil in conformity with the program of studies.

Among the different sciences taught in the Finnish schools geography has always occupied and still occupies an important place. To be acquainted with the main principles and facts of geography is considered necessary not only for everybody who wishes to continue his studies at some university or other institute of learning, but for any person who claims to be educated. Not to know the principal countries and the capital cities of the world is in Finland regarded as a sure sign of deficient culture.

Geography in the Primary Schools

In conformity with this opinion geography is studied in all the primary and secondary schools of the country. In the former type of school the study of geography commences with the second year, when two lessons a week, each comprising half an hour, are devoted to it. This course is mainly confined to a study of the native town and its neighborhood, or, in a rural school, of the parish. Excursions are made to representative places, and a few simple maps are drawn. In the following year the systematic study of geography with the aid of a textbook begins. The course in this class, which occupies two hours a week, is mainly concerned with the geography of Finland, tho the principal facts of European geography are included. During the next year Europe forms the object

of study, tho part of the time (two hours a week) is devoted to a general survey of the other continents. These are studied in greater detail during the fifth year and the course in the geography of Finland is again gone thru. In the last year only one hour a week is allotted to geography. The work comprises a repetition of the most important facts previously learned and the outlines of physical and general geography.

In examining the curriculum of the elementary school, it must be observed that the course in geography varies much in the several schools, and that there is a considerable difference between the city schools and the rural schools in this respect. Concerning the latter, the report of a state committee has just been published which, among other things, embodies considerable changes in the content and method of teaching geography. It is proposed to give the study a more practical character and link it up with lessons in agriculture, gardening and other rural occupations. According to this report only part of the scholastic year should be devoted to the theoretical study of the subject.

GEOGRAPHY IN THE SECONDARY SCHOOLS

Turning now to the secondary school we find that in all eleven hours a week are given to geography in the five classes of the junior high school. As for the position of geography in the senior school, the number of lessons devoted to it varies between one and three a week. Tho it is generally admitted that this time is too short for a serious study of the subject, the press of other subjects especially languages and mathematics, renders a change in favor of geography difficult or impossible.

The course gone thru in the junior high school corresponds closely to the one outlined above for the elementary school, but the material is presented with more details and with the aid of a more comprehensive textbook than that used in the lower school. The treatment differs somewhat in the several schools, but as a rule Finland and the North of Europe forms the object of the study in the first class, the rest of Europe in the second class, Asia and Africa in the third class, America and Australia in the fourth class. The course of the fifth class, where only one hour a week is allotted to geography, comprises a discussion of the general principles of physical geography and a repetition of the most important facts of political geography previously treated.

IN THE SENIOR SCHOOL

While the position of geography is secure in the junior high school and the course well defined, the same cannot be said of the standing of geography in the senior school. Not only is the number of lessons given to it small, varying between one and three hours a week, but the matter treated is vague and incoherent. The study, in fact, lacks definite aim and purpose. In schools where three hours are devoted to geography the study of physical geography, especially the distribution of animals and plants, occupies most of the time. But both subject matter and method vary greatly in different schools. Commercial and political geography, as a rule, receive scant attention. If only one lesson a week (in the highest class) is given to geography, the work is limited to a repetition of the course gone thru in the junior school.

METHODS

The teaching of geography is done in close connection with a textbook. The main thing for the teacher is thus to explain, illustrate and supplement the text of the book. The project method is not used and scarcely known in Finland, nor do the pupils use supplementary works, statistics and official publications to write an essay on a geographical question. The work on the part of the pupil is thus mainly confined to the study of the textbook with the aid of a map, contained in a separate atlas. A few simple maps are, of course, made, but there is scarcely any field work, nor do the pupils undertake any survey of urban or rural conditions and activities. School excursions, however, are coming into vogue.

During the geography lesson pictures and postcards are circulated in the class. Lantern slides are not yet widely used, as many schools do not possess necessary apparatus. This refers especially to motion pictures. Only the largest schools are provided with rooms and instruments for this purpose. Instead, the pupils of the smaller schools visit some picture theater where scenes of geographical interest are shown.

In criticizing the geography teaching in Finland it must be taken into account that the schools do not possess such excellent textbooks as are within the reach of every American pupil. But allowing for this, there remain many weaknesses and defects which could be remedied, if the teachers were really interested in the subject and alive to the value of the study. The main fault of the

teaching seems to be that it makes geography a science of the memory instead of a training in thinking and citizenship. In particular, the unity of physical and human geography is not made clear, and the interdependence of geographical facts and phenomena is not sufficiently stressed. Many important branches of the science, such as commercial geography, are more or less neglected. There is an endeavor to explain the origin and growth of cities, but few teachers have a real comprehension of the importance of the cities as centers of activity, progress and civilization.

PREPARATION OF TEACHERS

Most of the geography teachers in Finland have had special preparation for their work. Geography is a standard subject in all the normal schools. The elementary school teacher is therefore well prepared for her task. The position of teacher in a secondary school is perhaps, not so favorable in this respect. It is true that, as a rule, he has studied geography during two years at a university. But in most cases geography is considered a minor subject, while zoology and botany are the principal sciences taken. This entails many weaknesses and disadvantages. Human geography is neglected. The connection between geography and history is not made clear. The importance of geography as a connecting link between the exact and the social sciences is not grasped. What is wanted is a specialist, who combines thoro knowledge of the different branches of the subject with broad views of its value and possibilities. But even if such teachers could be found, their employment would be difficult, considering the small schools and the moderate means available for teaching purposes in Finland.

GEOGRAPHY AS A CORE SUBJECT FOR THE CURRICULUM

MAYME PRATT RENNER
Teachers College, Columbia University

Knowledge, the collective experiences of mankind is today separated into many subjects or parts, wholly unsuited for the purposes of education. The search of the educator has been for a core subject around which to build his curriculum and thus to afford a unifying element in training the youthful, socially uninstructed mind.

Primitive Education

Among primitive folk, before there had occurred any great expansion and division of social knowledge, education consisted in the informal instruction of the youth in the experiences of the tribe—the record of the successes and the failures of the tribe's progressive adjustments to its environment, i.e., its folk lore.

Mediaeval Curricula

During the Middle Ages, tribal life gave way to the feudal state and society came to be dominated by the church. As a consequence, the social viewpoint was theological. Knowledge had expanded, but there was still unity in the curriculum for education was built around central theological concepts.

The English School

England typifies the emergence of a modern state from under this religious hierarchy. Religion itself, as a core subject for the curriculum disappeared, but the old tools of religious education, Latin, Greek, and Hebrew, persisted as the basis of the curriculum. Hence the rise of the classical education. The English common school, the prototype for the American public school, grew up to prepare students for this classical university.

The Early American System

Due no doubt to our English heritage, Latin and Greek were made the basis of the early American curriculum, while Puritan fervor brought back a measure of theology into its subject matter. This is clearly seen in the case of Harvard and the other early

colleges. The academies and Grammar Schools were mere appendages of this system. Meanwhile, pioneer conditions of our democracy made it imperative that the elementary schools build their curriculum around the three R's.

Later Aspects of American Schools

At the close of the nineteenth century, the colleges and universities of America still centered their instruction around the classics, offering side lines of history, mathematics and smatterings of science. The high schools offered four year courses in Latin with a small range of "disciplinary" subjects. In the elementary schools, the three R's apparently expanded so as to include geography, general nature studies, etc. But geography was really nothing more than a reading subject, whose content was drawn from every conceivable source.

Present Tendencies in American Schools

The colleges and universities have abandoned the classics as a central ideal in education. Instead, they make a few requirements which allow the student to "major" in any subject of his own choosing, filling in the balance of his work from a wide range of electives. The elective system is not here condemned but an education should accomplish approximately the same thing for a student whether he major in domestic science or banking. However, the A.B., A.M. and Ph.D. no longer represent anything in common among college men and women.

The high schools no longer place any emphasis on Latin, indeed, many of them no longer offer it. The core of the curriculum seems to be a study of English and literature. The study of English is highly essential but it affords no practical basis for the tying up of life experience with academic training.

The elementary school has abandoned the three R's as a formal basis of the curriculum. Its aim is to teach all the elementary branches of knowledge thru a series of problems and projects. These problems and projects are intended to link practical affairs of the world with formal knowledge. This is indeed praiseworthy, but what is to unify these problems and projects? Will the student, after being subjected to them, emerge with a compact education? The teacher is asked to correlate these isolated prob-

lems and projects, but with what is she to correlate them? Teachers are nobly making the attempt but they have been furnished with nothing fundamental upon which to build their projects or from which to draw their problems. The departmental plan of teaching only aggravates this problem of correlation. Hence our elementary schools today are in danger of becoming lost in a hopeless maze of unrelated problem investigations.

THE SEARCH FOR A CORE SUBJECT

Many subjects have been proposed to give the modern curriculum unity. English composition has been widely used in this capacity. English composition affords the child an opportunity to read and speak on all his subjects and so does result in some measure of correlation. Questions which will lead to investigation along the line of other subjects do not, however, naturally arise out of English composition, for it is not the point of departure but the point of ultimate arrival in education. On the other hand, geography, the study of man's adjustment to his environment, is the real point of departure, for out of a problem or aspect of regional geography emerge questions of civics, agriculture, botany, arithmetic, commerce, industry, history, etc. History has also been proposed for a core subject, but as history is simply the record of the geographies of the past, nothing is gained by its use rather than geography.

GEOGRAPHY IN AMERICAN UNIVERSITIES

The high school has professed to train students for college, but have they done so? If so, what accounts for the sudden appearance of geography in the curricula of many of the colleges, when geography is still considered by many educators to be below the rank of a high school subject? Students coming to the University of Illinois for training in social science have been so lacking in a grasp of man's fundamental relation to his environment that teachers of economics were compelled from necessity to build a course that would give students this necessary geographical background. This course crystallized in the book by Hunter and Watkins entitled "The Background of Economics."

At the Wharton School in the University of Pennsylvania it was found necessary to combine geography with their courses in commerce and industry. At Columbia University, the founders of

the new School of Business, realizing that it would be very difficult to train students in economics, foreign trade, banking, etc. without this environment basis, started the life of the school with a Department of Geography and made geography a required subject for later work in business subjects. It was also found that the Sociology Department in Columbia was taking much of the time in certain courses in sociology to give to the students the idea of man's relation to his environment as a necessary background for their sociological studies.

The University of Chicago has established a great school of geography in which to thoroly train professional geographers but in addition, there has been worked out at that school a system of minor sequences of courses in geography to furnish students in other lines with a basic grasp of man's fundamental relation to his world, a thing which offers promise of giving an underlying principle to education. Thus we see our colleges and universities coming to the realization of the fundamental and necessary character of geography, while our high schools and elementary schools neglect it. Will our elementary school educators learn this great lesson in curriculum building from the universities or will they continue to follow their present course of building the curriculum around derived subjects and neglect the real point of departure for the study of all of the economic and social life of man.

LET'S GET ACQUAINTED

DEAR EDITOR:

I have received so much help from other teachers' suggestions in the JOURNAL OF GEOGRAPHY, I wondered if a plan that I have been using would interest others. I call it, "Let's Get Acquainted."

My pupils became interested in forming an acquaintance with children entirely unknown to them in many sections of the United States and foreign countries. I assigned each pupil a state and they chose in the assigned state a city and wrote to the Secretary of the Chamber of Commerce for views of the city. The majority of the letters were promptly answered. The views were sent on the immediate receipt of the letters. To this same city and to a number of cities of foreign countries that we will study this year they addressed letters to sixth grade classes in care of the respective city superintendents. We enclosed in the letter a drawing, showing the products raised in this section of the country, how and when they were planted and harvested. Since rice is one of our chief crops we made a drawing showing how rice is irrigated. We next told them of the Evangeline Oak which is in our town, and which was made famous historically by the Acadians. Boxes of pecans, tobasco pepper, cotton, cane, corn, moss and a picture of the Evangeline Oak were prepared and mailed to our respective correspondents.

I find my classes not only more interested in language but they also feel more intimate towards their geography facts.

So far we have received interesting letters from California, Colorado, Indiana, Boston, Chicago, and Gulfport, Mississippi. I know that while we are studying these places my pupils will feel that they are finding out new things about real people and that the instruction then will surely be more beneficial.

Yours for getting acquainted,

ELISE SOULIER

Teacher of Geography,
St. Martinville High School,
Louisiana

ANNUAL MEETING OF THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

Madison, Wisconsin, 1925

The National Council held its annual meeting at the University of Wisconsin, December 28-29, 1925. The meeting was one of the largest and most successful in the history of the Council. All sessions were well attended; the papers presented were strong and carefully prepared; discussion was free, thoro, and spirited; and a high degree of professional interest was manifest at all times. The program as a whole emphasized junior high school geography and the contribution of geography to social science. Many of the papers presented will appear in future numbers of the *Journal*.

The relation of geography to the social sciences was discussed thoroly and there was a strong sentiment favoring a statement by the National Council defining the relationship that should exist. Accordingly the Executive Committee was directed to formulate a statement in accord with the sentiment expressed if, after careful investigation, such seemed desirable. The statement will be published later.

The committee on tentative standards of attainment for the first six grades presented a report that will be completed and published late this spring or in the fall.

The committee on resolutions presented the following which was adopted unanimously.

This meeting of the National Council of Geography Teachers has been an occasion of great interest and pleasure.

We wish to thank the Faculty of the Department of Geography for the hospitality extended to us in furnishing us a comfortable meeting place, for the privilege of using the University Club, and for the delicious luncheon which gave us the opportunity to become better acquainted.

We wish to thank those who have contributed, with excellent papers and critical discussion, to the success of the program.

It is a privilege to be so cordially welcomed in this great University of the State of Wisconsin.

Committee
MARY DOPP
HARRIET CARTER

The next annual meeting will be held at the University of Pennsylvania, Philadelphia, probably December 27-28, 1926. The exact dates have not been fixed.

The following business was transacted at the annual meeting of the Board of Directors and Executive Committee, December 29, 1925.

1. The nominating committee consisting of R. H. Whitbeck, R. G. Buzzard, and Alison E. Aitchison, presented its report, and the following officers were elected.

President, Erna Grassmuck, State Department of Public Instruction, Harrisburg, Pennsylvania

Vice President, Fred J. Breeze, Ball Teachers College, Muncie, Indiana

Vice President, C. J. Bollinger, University of Oklahoma, Norman

Secretary, George J. Miller, State Teachers College, Mankato, Minnesota

Treasurer, Douglas C. Ridgley, Clark University, Worcester, Massachusetts

Members of Executive Committee, terms to expire December, 1928: W. W. Atwood, Clark University, Worcester, Mass.; Bessie P. Knight, South High School, Minneapolis, Minn.; A. E. Parkins, George Peabody College for Teachers, Nashville, Tenn.

Directors at Large: Mendal E. Branom, Harris Teachers College, St. Louis, Mo.; Fred J. Breeze, Ball Teachers College, Muncie, Ind.; Angela Broening, Geography Supervisor, Junior High School, Baltimore, Md.; C. E. Cooper, Ohio University, Athens, Ohio; Erna Grassmuck, State Department of Public Instruction, Harrisburg, Penn.; Myrta McClellan, University of California, Los Angeles; Ellen C. Semple, Louisville, Ky.; Mabel Stark, Mills College, Oakland, Calif.

2. Dr. Parkins was directed to continue the magazine service established in 1920.

3. Dr. Ridgley was directed to continue the membership campaign.

4. The Secretary was directed to print 2,500 copies of the report of the committee on tentative standards of attainment for the first six grades when the report is ready for publication, and the Treasurer was directed to distribute the same. A charge of ten cents per copy was authorized.

5. The committee appointed to draft a tentative score card for geography textbooks was discharged.

6. The committee on standard tests was discharged.

7. The committee on junior high school geography was reorganized and extended to include the senior high school.

8. The President was directed to investigate the desirability of affiliation with the World Federation of Education Associations and report findings to the Executive Committee for decision.

GEORGE J. MILLER, *Secretary*

GEOGRAPHICAL PUBLICATIONS

Carpenter and Carpenter. **The Foods We Eat.** 181 pp., 165 illustrations. American Book Co., N. Y. 1925. 72 cents.

The "Foods We Eat," intended for fourth grade supplementary reading, is an introduction to real geography because it deals with the primary need of man—food. The foods of which it treats are the staple foods of children living in the temperate zone.

This book advocates field trips and excursions, and believes in visual education, in seeing and in experiencing how foods are produced and prepared for man. Since not everyone can make these trips, the book supplies for children such an experience. Children will enjoy reading it because it tells the contacts in every day life of a group of children of about the same age. It represents six children as visiting the farm and the factory. They talk with people who are engaged in producing the foods they eat—the staples, the fruits, the nuts and the sweets. The story element in the book holds the attention and leads one to read chapter after chapter.

Many children would like to take the sight seeing trips that the children in the book took; then they could compare experiences. Without that experience they will enjoy the book, and will get many geographical ideas and suggestions of how to see geography in the things about them. They will realize more than before to what extent they are dependent upon others for their every day necessities and luxuries. They will realize that even children in other parts of the world are helping to produce foods for themselves and to sell. Many attractive pictures, both colored and uncolored, illustrate the travel experiences of the children.

The language of the text is suited to fourth grade children. A few revisions could be made to make the meaning clearer.

Ohio University,
Athens, Ohio
JANE K. ATWOOD

Vinnie B. Clark. **Europe. A Geographical Reader.** 555 pp., 15 maps and many pictures. Silver, Burdett and Company, New York. 1925.

This book contains a mass of information on Europe. Each country is treated separately. The book is primarily a geographic reader, altho considerable history is found here and there. There are uncolored maps of the regions discussed and they contain most of the places mentioned in the text. The pictures are well selected. Accompanying each picture is a caption and usually a brief explanation. At the end of the book is a short bibliography on each country.

While reading certain pages of the book, one is likely to obtain the idea that he is reading a textbook instead of a geographic reader. There are too many facts and not enough description or explanation on some pages. Again, there are too many place names in some chapters. Many of the places mentioned are not important and they are difficult to pronounce and to remember. Too many difficult names take a certain amount of pleasure away from the child when reading any book.

Despite the drawbacks mentioned, the book can be used with much profit by children in the upper grades of the elementary school and in the junior high school. Even more advanced pupils could read the book. Much of the information is new and is not readily found elsewhere.

Chicago Normal College FREDERICK K. BRANOM

D. H. Davis. **The Geography of the Mountains of Eastern Kentucky.** 187 pp., 21 maps, 58 photos. Kentucky Geological Survey, Frankfort, Ky. 1924.

The survey of the mountains of eastern Kentucky by Dr. Davis is a welcome addition to the few detailed geographic studies of the United States that are available. The author points out the adjustments that have been made there to environmental conditions, and offers definite suggestions for a more effective utilization of the assets of the region.

The book is organized in two parts. Part I deals with the physical environment, and with the subdivision of the region into two provinces, "The Ridge Top and Limestone Valley Settlements," and "The Creek Bottom Settlements." The bases for this subdivision are the differences in (1) the distribution of population, (2) the responses made to environmental conditions.

Part II consists of a critical analysis of the economic assets of the region. In the discussion on Land Utilization, maps, tables, and pictures are used freely to indicate (1) distribution of improved land, (2) farm practices, (3) crops, (4) types of farms and farm houses, (5) living conditions, (6) improved and unimproved roads. These form effective supplements to the text. The author urges a more scientific use of the land with respect to (1) the limited amount of agricultural land, (2) forest planting and conservation on the slopes too steep for cultivation. Particular stress is laid upon the need for improved transportation facilities thruout the rural districts, since the lack of them is a serious handicap.

The author shows the significance of the large resources of high grade bituminous coal, and the effect its exploitation has had upon (1) railroad construction, (2) urban and industrial development within the region. Dr. Davis brings out clearly the relationships between topography and (1) railroad routes, (2) the location of cities. Useful contrasts are drawn between different types of urban and semi-urban centers.

The book includes a concise summary of the author's conclusions and a useful bibliography.

University of Illinois JOHN B. APPLETON

J. D. Rogers. **Australasia. Historical Geography of the British Dominions.** Vol. VI. Revised and enlarged by R. N. Kershaw. 382 pp, 9 maps. Oxford University Press, American Branch, N. Y. 1925. $2.50.

Mr. Kershaw, Rhodes Scholar for New South Wales in 1918, has revised and enlarged the first edition by including the period between 1900 and 1914 and adding a new chapter on Australasia during and after the War.

The book contains a wealth of detailed information from the time of Pliny's reference to "Southlanders" until the charting of Australia and the island groups of the South Pacific. Piracy achieved few discoveries. These came when business principles elbowed out piracy and began establishing chartered companies with definite trade centers. Thus trade led to Colonies that remained attached to the mother countries. The problem of peopling these colonies and making them self-supporting is the main theme of the book. In Australia, the colonists waged no wars with the natives. Their conquest was that of the desert, at least what they deemed to be desert.

It is unfortunate that no photographs were included in the original or revised editions.

State Teachers College, Mankato, Minnesota CORA P. SLETTEN